

JAN 03 2007

OKUDA, et al., 10/050,519
03 January 2007 Amendment
Responsive to 01 August 2006 Office Action

520,41089X00 / NT0564US
Page 2

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claim 1 (Currently Amended) A system for inspecting a defect of an electronic circuit pattern formed on a semiconductor wafer, comprising:

an inspection area setting unit which divides an area to be inspected into at least two partial inspection areas on the semiconductor wafer, each of which has each of different inspection conditions;

an inspection condition setting unit which sets each inspection condition for each partial inspection area that is set by the inspection area setting unit;

an image acquiring system which acquires an image signal from the each partial inspection area on the semiconductor wafer; and

an inspection executing unit which executes an inspection to detect the defect by image-processing the image signal acquired by the image detection acquiring system under the each inspection condition which have been set by the inspection condition setting unit, for each partial inspection area set by the inspection area setting unit,

wherein the inspection area setting unit divides the area to be inspected into at least the two partial inspection areas including a cell area and a non-cell area areas according to layout data, and the inspection condition setting unit sets conditions for the image acquiring system not to detect a reference image for each partial image in the cell area and to detect a reference image for each partial image in the non-cell area. the each inspection condition for each partial inspection area is

OKUDA, et al., 10/050,519
03 January 2007 Amendment
Responsive to 01 August 2006 Office Action

520.41089X00 / NT0584US
Page 3

~~that a false report rate is a fixed value or less, or a detection rate of a specified defect is a fixed value or more.~~

Claim 2 (Cancelled)

Claim 3 (Cancelled)

Claim 4 (Original) A defect-inspection control system for inspecting a defect of an electronic circuit pattern according to claim 1, wherein the inspection area setting unit comprises a display screen for overlaying at least one of a defect distribution map showing distribution of defect positions, a layout pattern, and a detected image of the area to be inspected, on an inspection area setting state, or for displaying at least one of them and the inspection area setting state simultaneously.

Claim 5 (Original) A system for inspecting a defect of an electronic circuit pattern according to claim 1, wherein the inspection area setting unit divides the area to be inspected into a defect output area and a non-output area; and the inspection executing unit outputs a defect, which exists in the defect output area set by the inspection area setting unit.

Claim 6 (Cancelled)

OKUDA, et al., 10/050,519
03 January 2007 Amendment
Responsive to 01 August 2006 Office Action

520.41089X00 / NT0564US
Page 4

Claim 7 (Original) A system for inspecting a defect of an electronic circuit pattern according to claim 1, wherein the inspection area setting unit calculates a range of each function block included in an area to be inspected according to the layout data, in order to set the partial inspection areas.

Claims 8 and 9 (Cancelled)

Claim 10 (Previously Presented) A system for inspecting a defect of an electronic circuit pattern according to claim 1, wherein the inspection area setting unit displays a layout pattern of a whole chip on an inspection area setting screen, and registers an area, which has been specified or has been edited by a user on the layout pattern, as the partial inspection area.

Claim 11 (Original) A system for inspecting a defect of an electronic circuit pattern according to claim 1, wherein the inspection area setting unit superimposes each of the partial inspection areas on the layout pattern to display them.

Claim 12 (Original) A system for inspecting a defect of an electronic circuit pattern according to claim 1, wherein the inspection area setting unit superimposes and displays at least two of: each of the partial inspection areas; the layout pattern; and a position where a defect occurred.

OKUDA, et al., 10/050,519
03 January 2007 Amendment
Responsive to 01 August 2006 Office Action

520.41089X00 / NT0584US
Page 5

Claim 13 (Original) A system for inspecting a defect of an electronic circuit pattern according to claim 1, wherein the inspection executing unit classifies detected defects by kind of defect; and

the inspection area setting unit superimposes a position on the layout pattern, where the defect occurred, on the layout pattern by using symbols, which are unique to kinds of defects, to display them.

Claim 14 (Original) A system for inspecting a defect of an electronic circuit pattern according to claim 1, wherein the inspection executing unit classifies detected defects according to at least whether the defect is a true defect or a false report.

Claim 15 (Cancelled)

Claim 16 (Currently Amended) A system for inspecting a defect of an electronic circuit pattern formed on a semiconductor wafer, comprising:

an inspection condition setting unit which calculates peculiar inspection condition for each position of an area to be inspected on the semiconductor wafer;

an inspection area setting unit which divides the area to be inspected into partial inspection areas on the semiconductor wafer, each of which has the substantially same inspection conditions that are calculated by the inspection condition calculating unit;

an image acquiring system which acquires an image signal from the each partial inspection area on the semiconductor wafer; and

OKUDA, et al., 10/050,519
03 January 2007 Amendment
Responsive to 01 August 2006 Office Action

520.41089X00 / NT0564US
Page 6

an inspection executing unit which executes an inspection to detect the defect by image-processing the image signal acquired by the image detection acquiring system under the each inspection condition which have been set by the inspection condition setting unit, for each partial inspection area set by the inspection area setting unit,

wherein the inspection area setting unit divides the area to be inspected into the partial inspection areas including a cell area and a non-cell area according to layout data, and the inspection condition setting unit sets conditions for the image acquiring system not to detect a reference image for each partial image in the cell area and to detect a reference image for each partial image in the non-cell area, the each inspection condition for each partial inspection area so that a false report rate is a fixed value or less, or detection rate of a specified defect is a fixed value or more.

Claim 17 (Original) A defect-inspection control system for inspecting a defect of an electronic circuit pattern according to claim 16, wherein the inspection area setting unit comprises a display screen for overlaying at least one of a defect distribution map showing distribution of defect positions, a layout pattern, and a detected image of the area to be inspected, on an inspection area setting state, or for displaying at least one of them and the inspection area setting state simultaneously.

OKUDA, et al., 10/050,519
03 January 2007 Amendment
Responsive to 01 August 2006 Office Action

520.41089X00 / NT0564US
Page 7

Claim 18 (Original) A system for inspecting a defect of an electronic circuit pattern according to claim 16, wherein the inspection area setting unit divides the area to be inspected into a defect output area and a non-output area; and the inspection executing unit outputs a defect, which exists in the defect output area set by the inspection area setting unit.

Claim 19 (Cancelled)

Claim 20 (Withdrawn) A system for inspecting a defect of an electronic circuit pattern formed on a semiconductor wafer, comprising:

a pattern inspecting apparatus having a defect extracting unit which extracts coordinates of a defect position on the semiconductor wafer, and an ID of the defect; and

a defect reviewing apparatus having: a partial inspection area data generating unit which generates partial inspection area data according to layout data on the semiconductor wafer,

an inspection condition setting unit which determines an image-detection condition parameter in response to characteristic of an area where the defect position extracted by the defect extracting unit is existed on the semiconductor wafer, based on the partial inspection area data generated by the partial inspection area data generating unit,

an image acquiring system which detects an image signal of the defect under the image-detection condition parameter determined by the inspection condition setting unit, and

OKUDA, et al., 10/050,519
03 January 2007 Amendment
Responsive to 01 August 2006 Office Action

520.41089X00 / NT0564US
Page 8

a display unit which displays the image signal of the defect acquired by the defect acquiring system, on a screen.

Claim 21 (Withdrawn) A system for inspecting a defect of an electronic circuit pattern according to claim 20, wherein in the image detection system, the image-detection condition parameter includes an image-pickup magnification or an image detection mode for specifying whether or not a reference image is detected.

Claim 22 (Currently Amended) A method for inspecting a defect of an electronic circuit pattern formed on a semiconductor wafer, comprising:

a process for reading layout data of an electronic circuit pattern on the semiconductor wafer;

a process for dividing an area to be inspected into a plurality of partial inspection areas on the semiconductor wafer according to the read layout data, each of which has each of different inspection conditions;

a process for setting each inspection condition for each of the divided inspection areas;

a process for acquiring an image signal from the each partial inspection area by an image acquiring system;

a process for executing an inspection to detect the defect by image-processing the image signal acquired by the image acquiring system under the each inspection condition that are set for the each partial inspection area; and

a process for displaying an executed result of the inspection on a screen;

OKUDA, et al., 10/050,519
03 January 2007 Amendment
Responsive to 01 August 2006 Office Action

520.41089X00 / NT0584US
Page 9

wherein in the process for setting each inspection condition, the each inspection condition for the each partial inspection area including a cell area and a non-cell area is set so that in the process for acquiring an image signal, not to detect a reference image for each partial image in the cell area and to detect a reference image for each partial image in the non-cell area, a false-report rate is a fixed value or less, or detection rate of a specified defect is a fixed value or more.

Claim 23 (Original) A method for inspecting a defect of an electronic circuit pattern according to claim 22, wherein in the process for dividing an inspection area into a plurality of inspection areas, the inspection area is divided into the plurality of inspection areas, each of which has different density of the electronic circuit pattern.

Claim 24 (Original) A method for inspecting a defect of an electronic circuit pattern according to claim 22, wherein the layout pattern, which has been divided into the plurality of layout patterns, is displayed on a screen.

Claim 25 (Original) A method for inspecting a defect of an electronic circuit pattern according to claim 22, wherein the layout pattern, which has been divided into the plurality of layout patterns, is identified for each divided area, and is displayed on a screen.

Claim 26 (Original) A method for inspecting a defect of an electronic circuit pattern according to claim 22, wherein in the process for dividing an inspection area into a plurality of inspection areas, a range of each function block included in an

OKUDA, et al., 10/050,519
03 January 2007 Amendment
Responsive to 01 August 2006 Office Action

520.41089X00 / NT0564US
Page 10

area to be inspected is calculated according to the layout data, and thereby the inspection area is divided into the function blocks.

Claim 27 (Original) A method for inspecting a defect of an electronic circuit pattern according to claim 22, wherein in the process for dividing an inspection area into a plurality of inspection areas, distribution of wiring density in an area to be inspected is calculated according to the layout data, and thereby the area to be inspected is divided into areas, each of which has the same calculated wiring density.

Claim 28 (Original) A method for inspecting a defect of an electronic circuit pattern according to claim 22, wherein in the process for dividing an inspection area into a plurality of inspection areas, an inspection area is divided into areas, each of which has different criticality.

Claim 29 (Original) A method for inspecting a defect of an electronic circuit pattern according to Claim 22, wherein in the process for dividing an inspection area into a plurality of inspection areas, a layout pattern of a whole chip is displayed on a screen, in addition to it, the layout pattern is divided into areas, each of which has been specified by a user, and then the areas are registered.

Claim 30 (Original) A method for inspecting a defect of an electronic circuit pattern according to claim 22, wherein in the process for dividing an inspection area into a plurality of inspection areas, the inspection area, which has been divided into

OKUDA, et al., 10/050,519
03 January 2007 Amendment
Responsive to 01 August 2006 Office Action

520.41089X00 / NT0564US
Page 11

the plurality of inspection areas, is superimposed on the layout pattern to display them.

Claim 31 (Original) A method for inspecting a defect of an electronic circuit pattern according to claim 22, wherein in the process for dividing an inspection area into a plurality of inspection areas, from among the inspection area, which has been divided into the plurality of inspection areas, the layout pattern, and a position where a defect occurred, at least two of them are superimposed to display them.

Claim 32 (Previously Presented) A method for inspecting a defect of an electronic circuit pattern according to claim 22, wherein in the process for executing the inspection, the detected defects are classified by kind of defect; and
in the process for displaying the executed result of the inspection on the screen, defect positions occurred on a layout pattern are superimposed on the layout pattern to display them, using symbols, which are unique to kinds of defects.

Claim 33 (Previously Presented) A method for inspecting a defect of an electronic circuit pattern according to claim 22, wherein in the process for executing the inspection, the detected defects are classified according to at least whether the defect is a true defect or a false report.

Claim 34 (Cancelled)

OKUDA, et al., 10/050,519
03 January 2007 Amendment
Responsive to 01 August 2006 Office Action

520.41089X00 / NT0564US
Page 12

Claim 35 (Withdrawn) A method for inspecting a defect of an electronic circuit pattern, comprising:

a process for acquiring coordinate information of a defect position on the semiconductor wafer, and an ID information of the defect, which have been detected by a pattern inspecting apparatus and stored in a first storage unit;

a process for generating partial inspection area data according to layout data on the semiconductor wafer,

a process for determining a image-detection condition in response to a characteristic of an area where the acquired defect position is existed on the semiconductor wafer, based on the generated partial inspection area data;

a process for acquiring an image signal of the defect under the determined image-detection condition by an image acquiring system,

a process for displaying the image signal of the defect acquired by the image acquiring system, on a screen.

Claim 36 (Cancelled)

Claim 37 (Withdrawn) A method for inspecting a defect of an electronic circuit pattern according to claim 35, wherein the image-detection condition includes an image-pickup magnification or an image detection mode for specifying whether or not a reference image is detected.

Claim 38 (Cancelled)

OKUDA, et al., 10/050,519
03 January 2007 Amendment
Responsive to 01 August 2006 Office Action

520.41089X00 / NT0564US
Page 13

Claim 39 (Withdrawn) A method for inspecting a defect of an electronic circuit pattern according to claim 35, wherein the process for displaying the image signal of the defect includes a process for giving classification information to the defect based on the image signal of the defect acquired by the image acquiring system to display the given classification information to the defect on the screen.

Claim 40 (Withdrawn) A method for inspecting a defect of an electronic circuit pattern according to claim 35, wherein in the process for determining the image-detection condition, the characteristic of an area where the acquired defect position is existed on the semiconductor wafer includes a density of the electronic circuit pattern.

Claims 41 and 42 (Cancelled)

Claim 43 (Withdrawn) A system for inspecting a defect of an electronic circuit pattern according to claim 20, wherein further comprising a classification unit which gives classification information to the defect based on the image signal of the defect detected by the image detection system to display on the screen of the display unit.

Claim 44 (Previously Presented) A system for inspecting a defect of an electronic circuit pattern according to claim 1, wherein the inspection condition setting unit automatically adjusts the each inspection condition for each partial inspection area until the false-report rate is a fixed value or less, or the detection rate of a specified defect is a fixed value or more.

OKUDA, et al., 10/050,519
03 January 2007 Amendment
Responsive to 01 August 2006 Office Action

520.41089X00 / NT0564US
Page 14

Claim 45 (Previously Presented) A defect-inspection control system for inspecting a defect of an electronic circuit pattern according to claim 16, wherein the inspection condition setting unit automatically adjusts the each inspection condition for each partial inspection area until the false-report rate is a fixed value or less, or the detection rate of a specified defect is a fixed value or more.

Claim 46 (Withdrawn) A system for inspecting a defect of an electronic circuit pattern according to claim 20, wherein the inspection condition setting unit automatically adjusts the each inspection condition for each partial inspection area until a false-report rate is a fixed value or less, or a detection rate of a specified defect is a fixed value or more.

Claim 47 (Previously Presented) A method for inspecting a defect of an electronic circuit pattern according to claim 22, wherein the process for setting each inspection condition automatically adjusts the each inspection condition for each partial inspection area until the false-report rate is a fixed value or less, or the detection rate of a specified defect is a fixed value or more.

Claim 48 (Withdrawn) A method for inspecting a defect of an electronic circuit pattern according to claim 35, wherein the process for setting each inspection condition automatically adjusts the each inspection condition for each partial inspection area until a false-report rate is a fixed value or less, or a detection rate of a specified defect is a fixed value or more.